

2 state calculations including photon emission

All calculations have detuning $\delta = 1E7$ and $\Omega = 2 \pi 2E7$ and a final time of about 6 microsec

The E-field is on and constant

The calculations show how the behavior of the population changes as more radiative damping is added

Notice that the population settles into a steady state

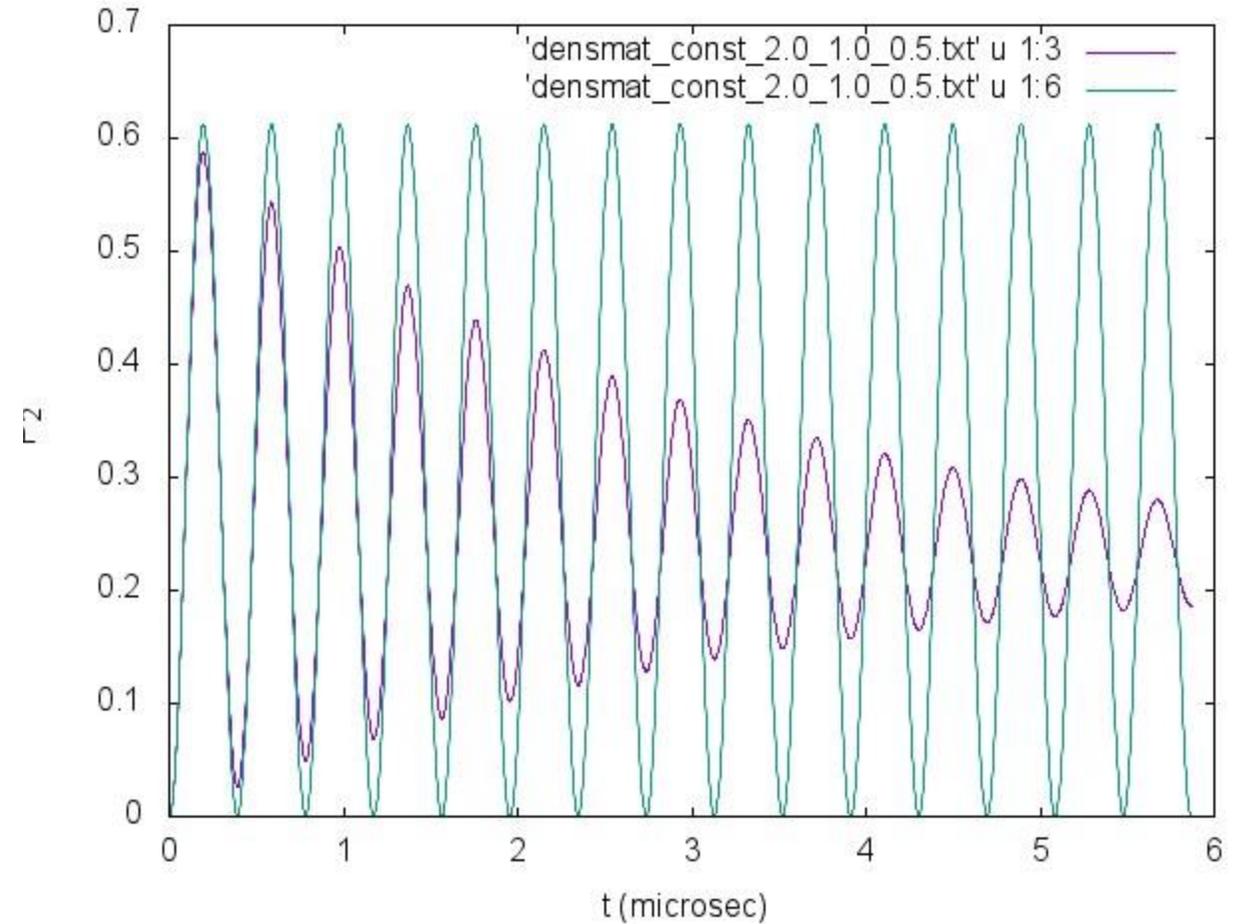
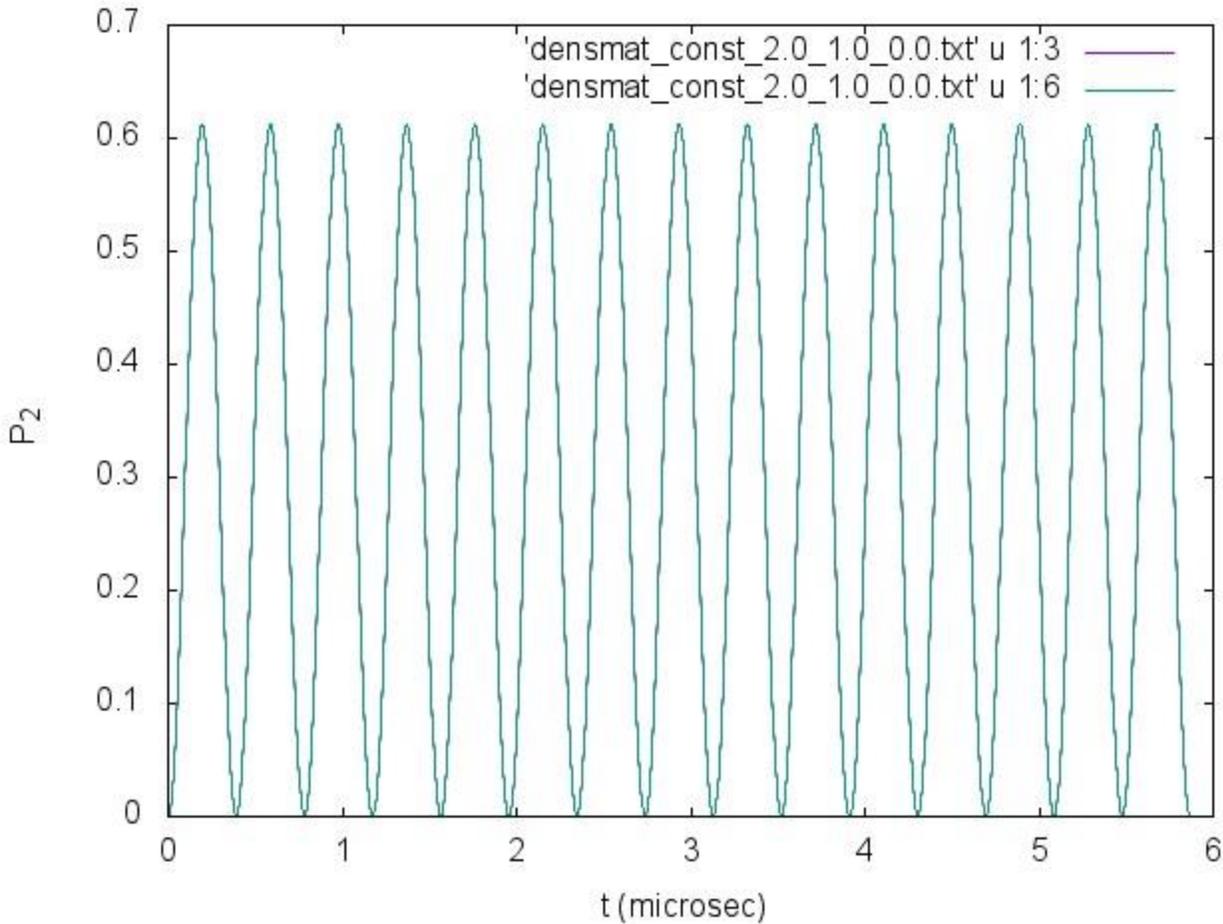
The speed the steady state is reached is faster for larger Γ

The steady state population is NOT the average of the $\Gamma = 0$ result when Γ is small?

For the Bloch sphere, notice that all components go to a value which means the $\langle \sigma \rangle$ becomes constant

The length of $\langle \sigma \rangle$ is less than 1

Population in excited state

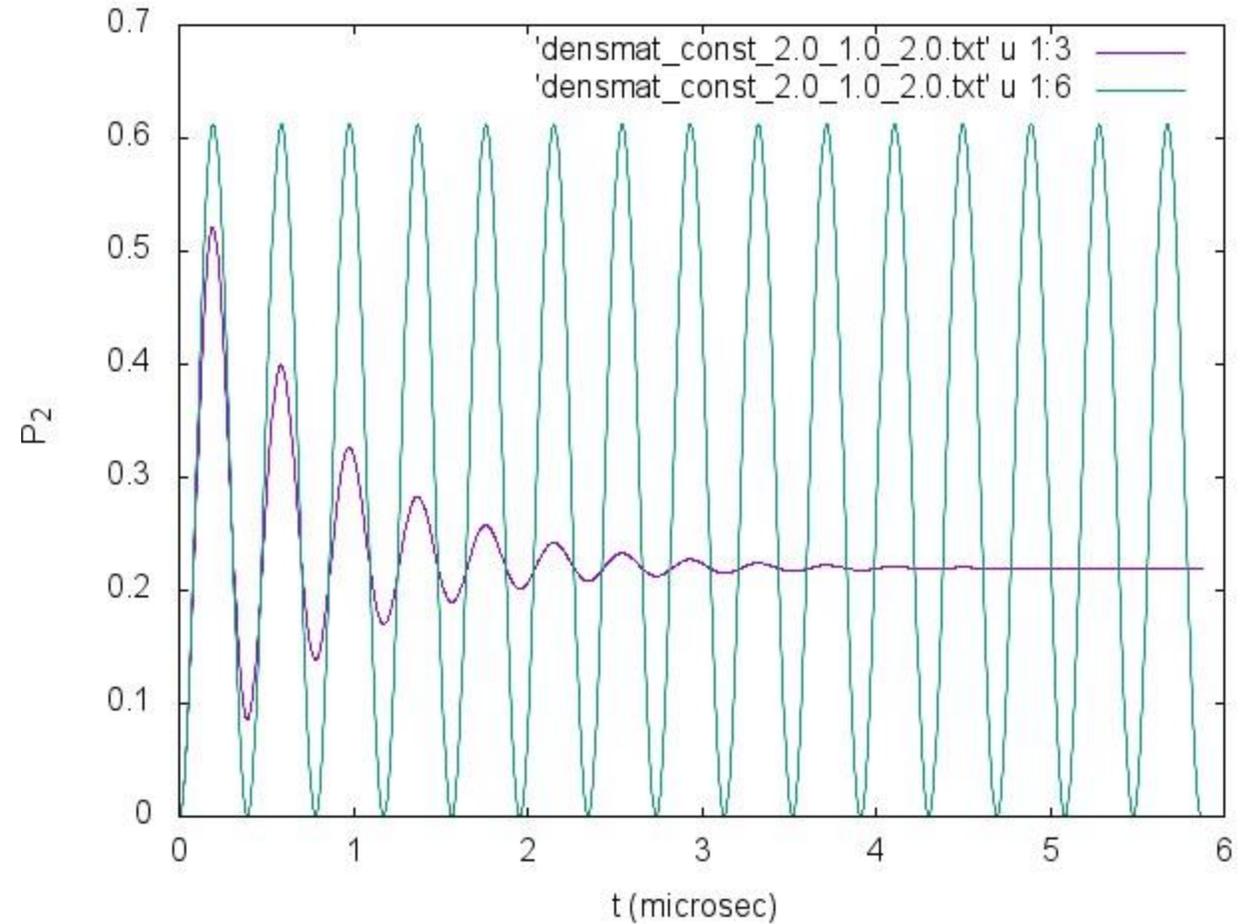
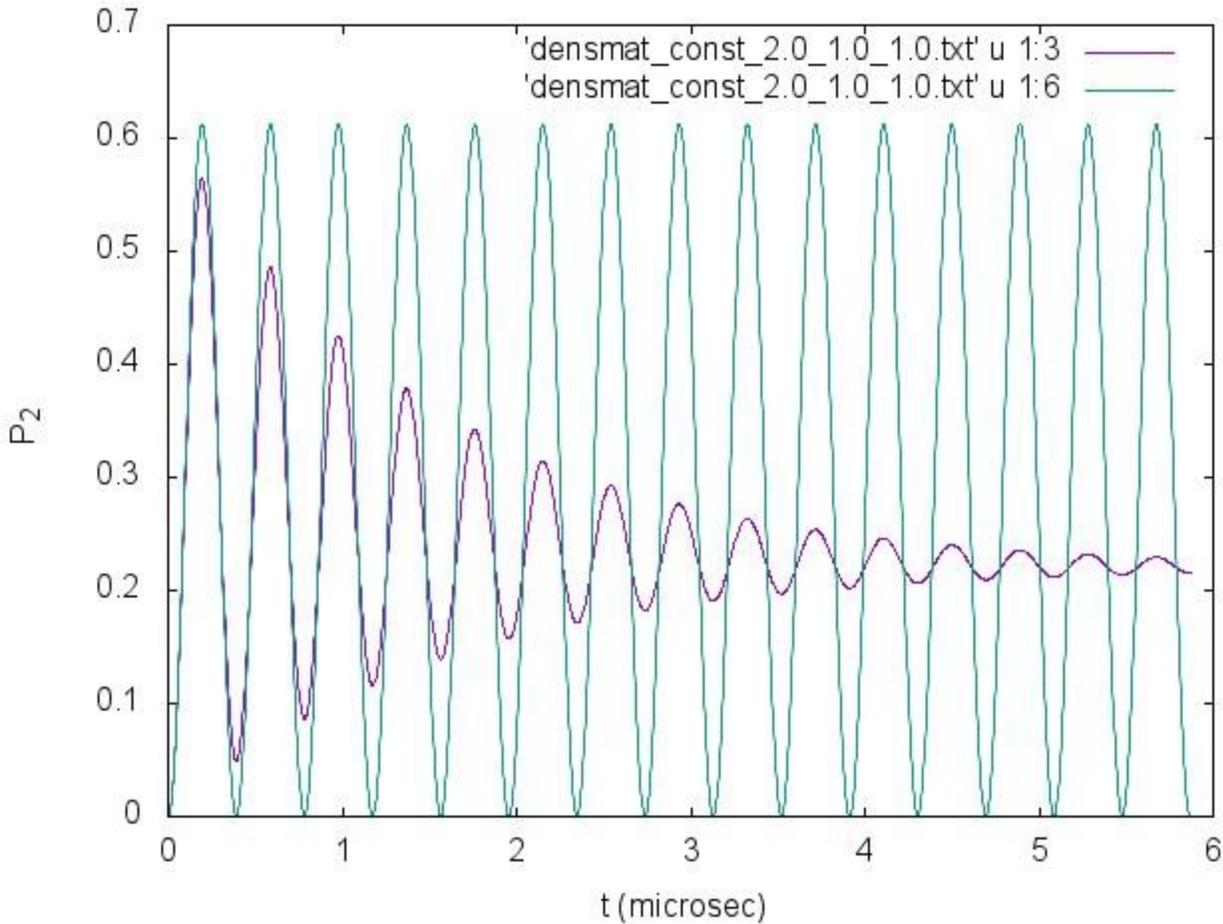


The left plot has $\Gamma = 0$ and the right plot has $\Gamma = 0.5E7$

The purple plot is from the density matrix calculation

The blue-green plot is from the 2 state, wave function calculation.

Population in excited state

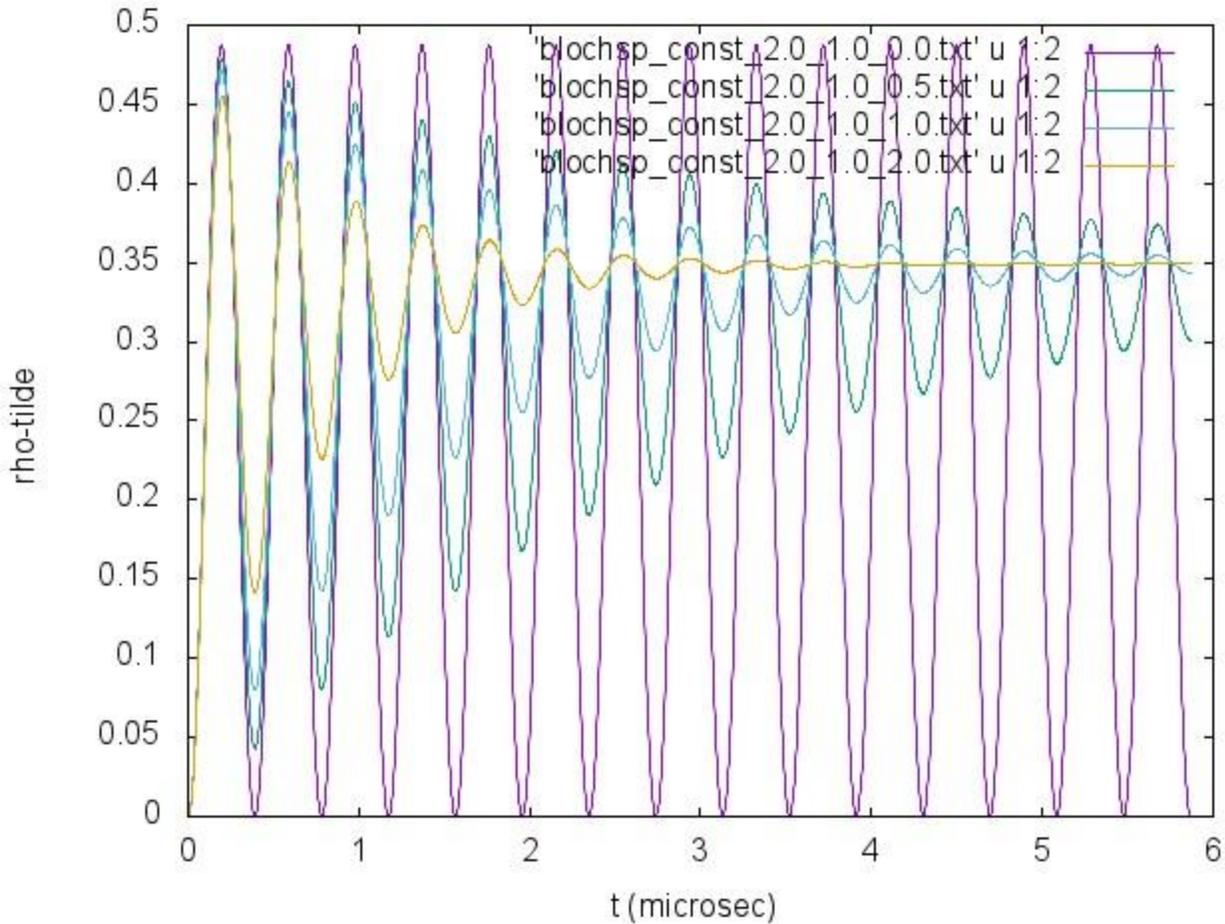


The left plot has $\Gamma = 1E7$ and the right plot has $\Gamma = 2E7$

The purple plot is from the density matrix calculation

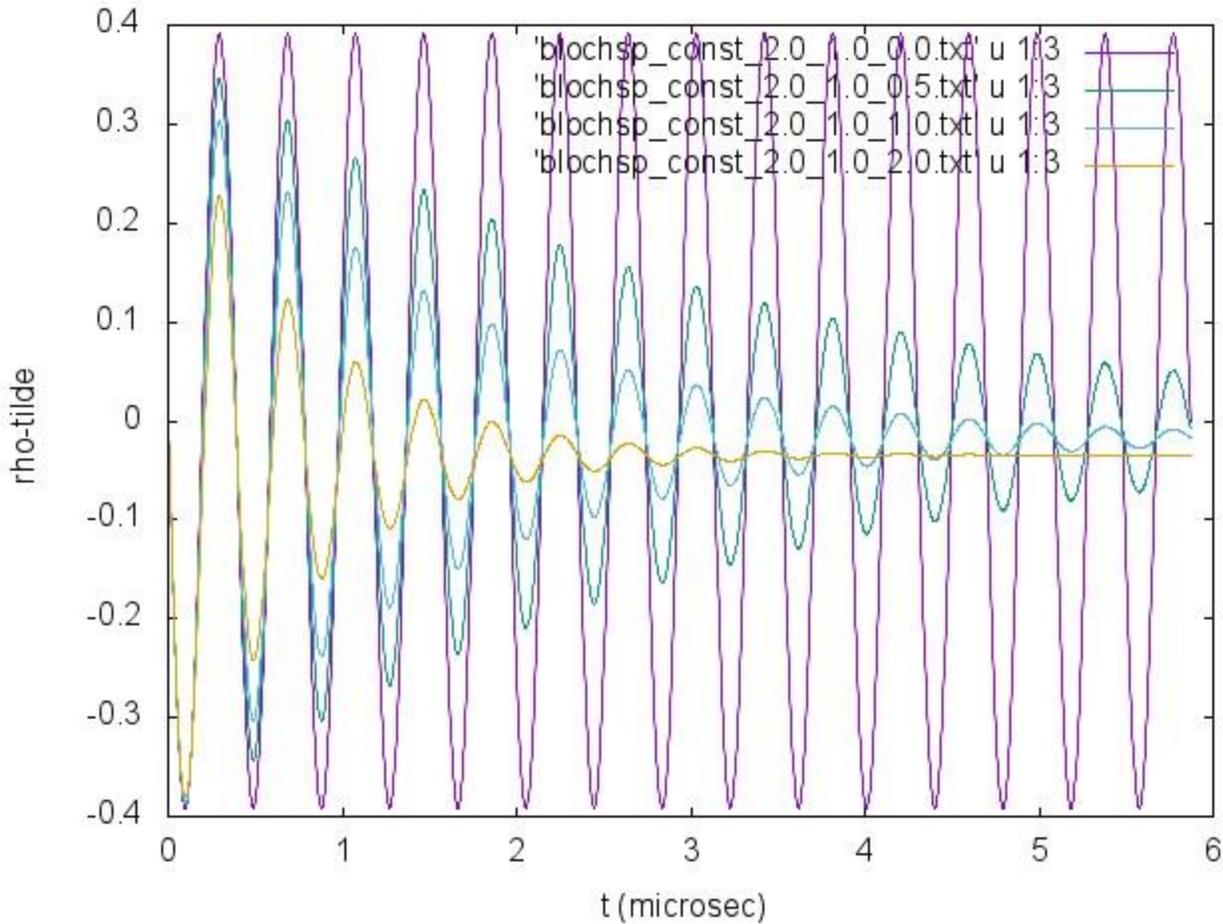
The blue-green plot is from the 2 state, wave function calculation.

Bloch sphere – x component



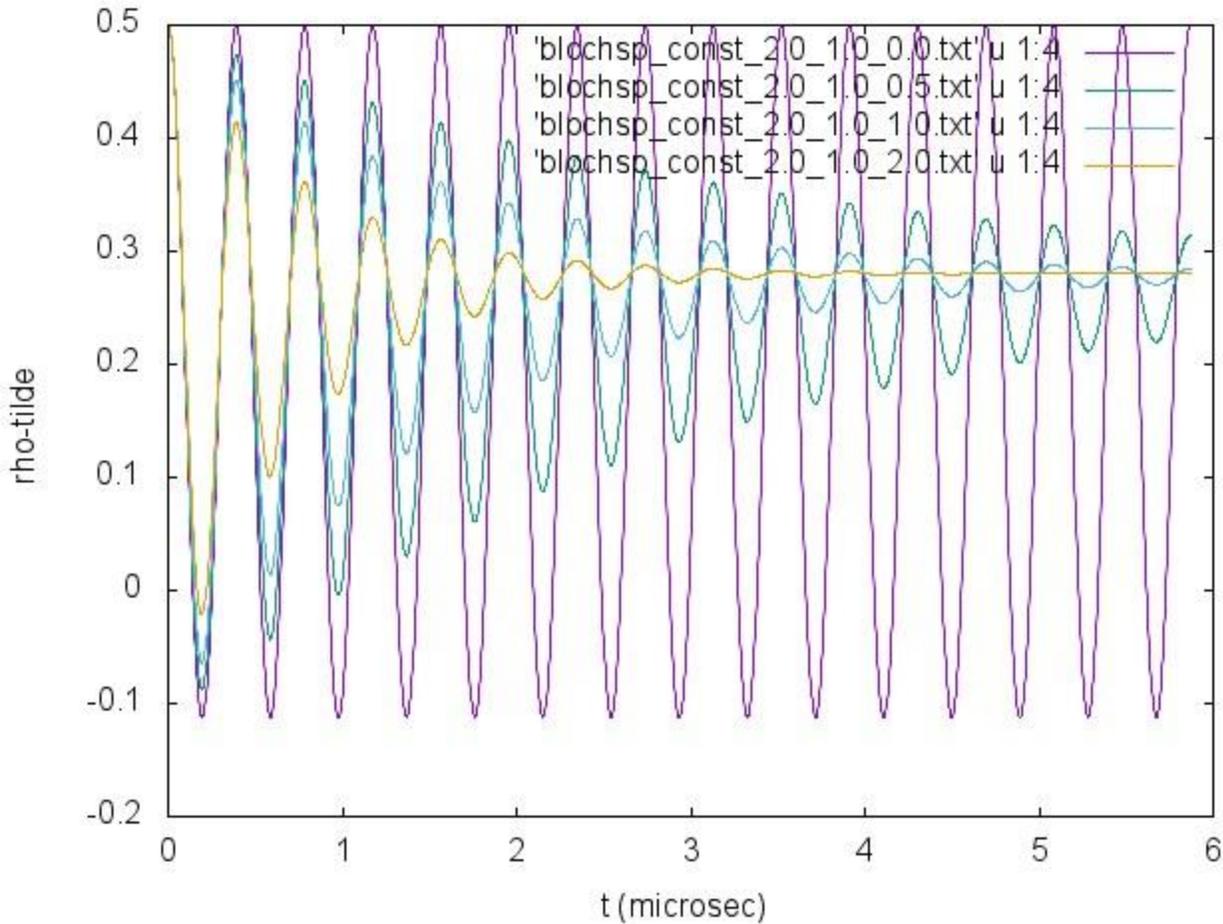
The decay rates are purple ($\Gamma = 0$), blue-green ($\Gamma = 0.5E7$), blue ($\Gamma = 1E7$) and gold ($\Gamma = 2E7$)

Bloch sphere – y component



The decay rates are purple ($\Gamma = 0$), blue-green ($\Gamma = 0.5E7$), blue ($\Gamma = 1E7$) and gold ($\Gamma = 2E7$)

Bloch sphere – z component



The decay rates are purple ($\Gamma = 0$), blue-green ($\Gamma = 0.5E7$), blue ($\Gamma = 1E7$) and gold ($\Gamma = 2E7$)

Look at the plots of the lines in 3D